| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/562,888 | 12/29/2005 | Orlando Miguel Pires Dos Reis Moreira | NL 030769 | 6924 |

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| EXAMINER |
|---|
| HUISMAN, DAVID J |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2183 | |

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|---|---|
| 10/18/2007 | PAPER |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|  | Application No. | Applicant(s) |  |
|---|---|---|---|
| **Office Action Summary** | 10/562,888 | PIRES DOS REIS MOREIRA ET AL. | |
|  | Examiner | Art Unit | |
|  | David J. Huisman | 2183 | |

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on <u>29 December 2005.</u>

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) <u>1-3</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-3</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>29 December 2005</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some *   c)☐ None of:

       1.☒ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>2/16/2007</u>.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____ .

## DETAILED ACTION

1.     Claims 1-7 have been examined.

### *Papers Submitted*

2.     It is hereby acknowledged that the following papers have been received and placed of

record in the file:  Documents Submitted with 371 Application, Certified Copy of Foreign

Priority Document, and Authorization for Extension of Time for All Replies as received on

12/29/2005, and IDS are received on 2/16/2007.

### *Information Disclosure Statement*

3.     Rule 37 CFR 1.98 requires that "Each publication listed in an information disclosure

statement must be identified by publisher, author (if any), title, relevant pages of the publication,

date, and place of publication." Applicant has failed to do so for non-patent literature documents

1 and 2.  Consequently, these references have not been considered by the examiner.  As

reference 1 appears to be very related to the instant application, applicant should provide all of

the above required information so that the examiner can determine if it constitutes valid prior art.

In addition, a copy of reference 5 was not provided, and therefore, it has not been considered

because the rule also states that an IDS must include a legible copy of "each publication or that

portion which caused it to be listed, other than U.S. patents and U.S. patent application

publications unless required by the Office".

## *Specification*

4.      The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

## *Comments*

5.      It has been noted that applicant originally filed seven claims and then replaced the set of

seven claims with a set of three claims. However, applicant does not give any indication as to

the cancellation of the original claims, and instead improperly begins numbering new claims at

#1. Applicant is advised to review rule 37 CFR 1.121 so that proper amendments are made in

the future. NOTE: Applicant's future amendments must include the status of the seven original

claims and include renumbering of any claims filed since the original seven.

## *Claim Objections*

6.      Claim 1 is objected to because of the following informalities:

- On page 18, lines 10 and 16, (CCE1, CCE2, ...) should be clarified and written in
    more definite terms. Specifically, the "..." should be eliminated. For instance, in
    lines 15-16, applicant could amend the claim to say "a chain of at least two cluster
    control elements (CCE1, CCE2)".

- On page 18, line 11, replace "procesor" with --processor--.

- On page 18, line 11, the transition to "two processor elements belonging to the
    same cluster..." is grammatically incorrect. Applicant should reword the claim as
    this phrase does not appear to be related to the preceding language.

- On page 18, lines 13-14, replace "those" with --the--

- On page 18, line 17, relocate "WSL" to after "first wait signal line" in line 16 for increased clarity.

- On page 18, line 19, replace "these signals" with --the wait signals--.

7.    Claim 3 is objected to because of the following informalities:

- On page 19, line 1, please replace "the indicator" with --each indicator--.

- On page 19, lines 6-7, the transition to "two processor elements belonging to the same cluster..." is grammatically incorrect. Applicant should reword the claim as this phrase does not appear to be related to the preceding language.

- On page 19, line 8, replace "those" with --the--

Appropriate correction is required.


### *Claim Rejections - 35 USC § 112*

8.    The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9.    Claims 1-3 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10.    Claim 1 is first unclear because in lines 9-10, applicant claims a cluster control facility and then identifies the singular facility with multiple identifiers (CCE1, CCE2, ...), which is unbounded. These same identifiers are used to identify control elements in lines 15-16. Clearly, the same identifier can't be used to identify two different things.

11.    Claim 1 is further unclear because it recites the limitations:

- "the processor element" in line 7 on page 18. There is insufficient antecedent

   basis for this limitation in the claim because it is not clear which processing

   element applicant is referring to (first or second). Applicant could replace such

   language with --a corresponding processor element--. Then, in line 8, applicant

   should replace "the processor element" with --the corresponding processor

   element--. Furthermore, in line 13, replace "those two processor elements" with

   --the corresponding and related processing elements--.

- "the related processor element" in line 7 on page 18. There is insufficient

   antecedent basis for this limitation in the claim because it is not clear which

   processing element applicant is referring to (first or second). Applicant could

   replace such language with --a related processor element--.

12.    Claims 2 is rejected under 35 U.S.C 112, 2$^{nd}$ paragraph, for being indefinite, because they
are dependent, either directly or indirectly, on an indefinite claim.

13.    Claim 3 is further unclear because it recites the limitations:

- "the processor element" in line 2 on page 19. There is insufficient antecedent

   basis for this limitation in the claim because it is not clear which processing

   element applicant is referring to (first or second). Applicant could replace such

   language with --a corresponding processor element--. Then, in lines 3-4 on page

   19, applicant should replace "the processor element" with --the corresponding

   processor element--. Furthermore, in line 13, replace "those two processor

   elements" with

--the corresponding and related processing elements--.

- "the related processor element" in lines 2-3 on page 19. There is insufficient

    antecedent basis for this limitation in the claim because it is not clear which

    processing element applicant is referring to (first or second). Applicant could

    replace such language with --a related processor element--.

## *Claim Rejections - 35 USC § 102*

14.     The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

15.     Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Gupta et al., EP

Patent Application Publication No. 0403014 A2 (as disclosed by applicant and herein referred to

as Gupta).

16.     Referring to claim 1, Gupta has taught a processor system comprising at least a first and a

second processor element (PE1, PE2) (see Fig.1, components 30, i.e., P1-P4), the first processor

element (PE1) having a cluster request indicator (CR12) related to the second processor element

(see Fig.4, component 72, and column 10, lines 30-46) and the second processor element (PE2)

having a cluster request indicator (CK21) related to the first processor element (see Fig.4,

component 72, and column 10, lines 30-46), the processor elements having an instruction set

enabling dynamic control of the indicators (see Fig.3 and column 6, line 49, to column 7, line 27;

note that the processors are synchronized, via indicator control, in response to instructions in the

instruction set), the indicators (CR12, CR21) having a value range comprising at least a first

value (positive indicator) indicating that the processor element requests to form a cluster with the

related processor element (see column 10, lines 41-46), and a second value (negative indicator)

indicating that the processor element does not request to form a cluster with the related processor

element (see column 10, lines 41-46), the system further comprising a cluster control facility

(CCE1, CCE2, ...) which detects the value of the cluster request indicators and organizes the

processor elements in clusters (see Figs.4-5), in accordance with the detected values, two

processor elements belonging to the same cluster if they have positive indicators related to each

other (see column 9, lines 40-43, and column 10, lines 41-46; positive indicators indicate

masking-in or clustering), or if there is a sequence of processor elements comprising those two

processor elements (see column 9, lines 40-43, and column 10, lines 41-46; negative indicators

indicate masking-out or non-clustering), wherein each pair of subsequent processor elements has

positive indicators related to each other, the cluster control facility comprising a chain of cluster

control elements (CCE1, CCE2, ..) (see Fig.4, at least component 76) which are coupled to each

other via a first wait signal line and a second wait signal line (WSL, WSR) (see Fig.4, and

column 11, lines 2-5; note the want_in and want_out signals), the wait signal lines carrying a

signal indicative of whether processor elements coupled to that line should suspend their

activities, the cluster control elements being able to modify these signals (see Fig.5 and column

4, lines 11-18; a want_out wait signal indicates that synchronization is to occur and that the

processor should stall its activities if it has reached the end of processing a shaded, independent

region of code).

17.     Referring to claim 2, Gupta has taught a processor system according to claim 1, wherein

elements organized in a cluster operate under a common thread of control.  See Fig.3 and column

3, lines 44-58, and note that when a cluster is formed all instructions branch based on the

comparison operation executed by a single processor.

18.     Referring to claim 3, Gupta has taught a method for operating a system comprising at

least a first and a second processor element (see Fig.1, components 30, i.e., P1-P4), the method

comprising programmably controlling a cluster request indicator of the first processor element

related to the second processor element (see Fig.4, component 72, and column 10, lines 30-46)

and programmably controlling a cluster request indicator of the second processor element related

to the first processor element (see Fig.4, component 72, and column 10, lines 30-46), the

indicator having a value range comprising at least a first value (positive indicator) indicating that

the processor element requests to form a cluster with the related processor element (see column

10, lines 41-46), and a second value (negative indicator) indicating that the processor element

does not request to form a cluster with the related processor element (see column 10, lines 41-

46), detecting the value of the cluster request indicators and organizing the processor elements in

clusters in accordance with the detected values (see Figs.4-5), two processor elements belonging

to the same cluster if they have positive indicators related to each other (see column 9, lines 40-

43, and column 10, lines 41-46; positive indicators indicate masking-in or clustering), or if there

is a sequence of processor elements comprising those two processor elements (see column 9,

lines 40-43, and column 10, lines 41-46; negative indicators indicate masking-out or non-

clustering), wherein each pair of subsequent processor elements has positive indicators related to

each other, the step of organizing the processor elements in clusters comprising the following

substeps, receiving an input value for a first wait signal and providing an output value for said

signal indicating whether the processor receiving said signal is forced to suspend its activities

(see Fig.4, and note the want_in input signal and the MATCH output signal. The MATCH

output signal, when in one state, causes stalling (see state 3 in Fig.5)), the output value

depending on the input value and a first and a second cluster request indicator (from Fig.4, and

column 10, lines 46-50, MATCH depends on want-in, which is a multi-bit signal coming from

other processors of the cluster), receiving an output value for a second wait signal and providing

an output value for said signal indicating whether the processor receiving said signal is forced to

suspend its activities, the output value depending on the input value and the first and the second

cluster request indicator. See the want_out signal of Fig.4, which is also received as feedback by

the state machine to advance between the states of Fig.5. The want_out causes stalling when the

other processors are not synchronized, as shown in state 3 of Fig.5), and the signal depends on

MATCH, which is in turn dependent on want_in, which means that want-out is dependent on the

input value want_in, and it is further dependent on the request indicators because MATCH is

dependent on the request indicators of Fig.4.


### Conclusion

19.     The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure. Applicant is reminded that in amending in response to a rejection of claims, the

patentable novelty must be clearly shown in view of the state of the art disclosed by the

references cited and the objections made. Applicant must also show how the amendments avoid

such references and objections. See 37 CFR § 1.111(c).

Dowling, U.S. Patent No. 6,026,478, has taught a VLIW machine with fork and join

instructions for clustering processors to work on the same task or splitting them to work on
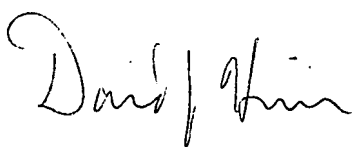
separate tasks.

Kranich et al., U.S. Patent No. 6,574,725, has taught fork and join instructions and also

the use of sync instructions to synchronize processors.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to David J. Huisman whose telephone number is (571) 272-4168.

The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


DJH
David J. Huisman
October 1, 2007